EEE4421C - Intro to Nanofab
Three Credits, Two hours, Engineering Topic.
**Instructor:** Dr. Nezih Pala.

**Specific Course Information:**
This course will give the students an introduction to micro/nanofabrication tools and techniques. It includes lab sessions where the students design, fabricate and test selected micro-scale devices.

**Specific Goals for the Course**
1. To give the students an understanding of the standard micro and nanofabrication techniques and the issues surrounding them.
2. To give the students an overview of the major classes, components and applications of Nano systems and the fundamental principles behind the operation of these systems.
3. To apply the knowledge of nanofabrication techniques for designing a micro system.

**Brief list of the topics to be covered**

a. Specific outcomes of instruction
Upon successful completion of this course, the student will:
1. Introduction - Pressure Sensor Overview
2. Cleanrooms - Simulations & Layout Design
3. Pattern Generation & Optical Lithography
4. Optical Lithography
5. Advanced Lithography
6. Crystal Struct - Micrometeorology and Materials Char
7. Wafer Cleaning and Surface Prep
8. Thin-Film Materials and Processes
9. Etching
10. Thermal Oxidation – Diffusion
11. Ion Implantation - CMP Chem–Mechanical Polishing
12. CMOS Fabrication
13. MEMS Process Integration – Yield
14. NO – CLASS Reserved for Lab

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
In this course the student will have to show
(a) an ability to apply knowledge of mathematics, science, and engineering (N/A)
(b) an ability to design and conduct experiments (simulations), as well as to analyze, interpret data (N/A)
(c) an ability to design a system, component, or process to meet desired needs (N/A)
(d) an ability to function in multi-disciplinary teams (N/A)
(e) an ability to identify, formulate, and solve engineering problems (homework) (N/A)
(f) an understanding of professional and ethical responsibility (N/A)
(g) an ability to communicate effectively (through project reports) (N/A)
(h) the broad education necessary to understand the impact of engineering solutions in a global and societal context (N/A)
(i) a recognition of the need, and an ability to engage in life-long learning (N/A)
(j) a knowledge of contemporary issues (N/A)
(k) an ability to use the techniques, skills, and modern engineering tools necessary for
engineering practice (N/A)
(l) a knowledge of probability and statistics (N/A)

**GRADING:**

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<th>Course Requirement</th>
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<td>Lab Effort</td>
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<td>Quizzes</td>
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<td>Homework</td>
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<td>Final Report</td>
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<td>Overall Grade</td>
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**Conversion of Numerical Grade to Letter Grad**

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